

CLAIMS

What is claimed is:

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1 1. An apparatus for processing data packets, comprising:
2 a first data processing unit adapted to filter incoming packets;
3 an addressable memory unit in which a plurality of instruction sets for packet processing
4 are stored;
5 a second data processing unit adapted to process incoming packets according to one of
6 said plurality of instruction sets; and
7 a data bus connecting the addressable memory unit and the first and second data
8 processing units.

1 2. The apparatus of claim 1, further comprising a policy condition table connected to said
2 first data processing unit, said policy condition table having a plurality of rules stored therein.

1 3. The apparatus of claim 1, further comprising a policy action table connected to said data
2 bus and said addressable memory unit, wherein said policy action table stores at least one data
3 processing policy.

1 4. The apparatus of claim 3, wherein at least one of said policies comprises:
2 a first address pointer element for identifying the location in said addressable memory
3 unit of one of said plurality of instruction sets, and
4 a second address pointer element for identifying the location in said addressable memory
5 unit of a state block.

1 5. The apparatus of claim 3, wherein said first data processing unit assigns a thread to each

2 said incoming packet, wherein said thread corresponds to one of said policies stored in said
3 policy action table.

1 6. The apparatus of claim 3, wherein said first data processing unit comprises logic for
2 matching a first incoming packet to a stored first rule and for generating a first thread if the first
3 incoming packet matches said first rule, said first thread identifying the location of one of said at
4 least one data processing policies in said policy action table.

1 7. The apparatus of claim 6, wherein said second data processing unit is adapted to process
2 the first incoming packet according to said data processing policy corresponding to said first
3 thread.

1 8. The apparatus of claim 6, wherein said data processing policy comprises a first address
2 pointer to a starting address of a first set of instructions and a second address pointer to a starting
3 address of a state block stored in said addressable memory unit, said state block used by said first
4 set of instructions for processing the first incoming packet.

1 9. The apparatus of claim 6, wherein said thread is assigned to said first incoming packet
2 based on said first rule.

1 10. The apparatus of claim 6, wherein said first processing unit further comprises logic for
2 matching a second incoming packet to a stored second rule and for generating a second thread if
3 the second incoming packet matches the second rule, said second thread identifying the location
4 of one of said at least one data processing policy in said policy action table.

1 11. The apparatus of claim 10, wherein said second data processing unit is adapted to process

2 the second incoming packet according to said data processing policy corresponding to said
3 second thread.

1 12. The apparatus of claim 10, wherein said second thread is assigned to said second
2 incoming packet based on said second rule.

1 13. The apparatus of claim 1, wherein said first processing unit further comprises logic for
2 matching a plurality of incoming packets to a stored corresponding plurality of rules and for
3 generating a thread for each packet that matches one of said plurality of rules, each said thread
4 identifying the location of one of said at least one data processing policy in said policy action
5 table.

1 14. The apparatus of claim 13, wherein the second data processing unit is adapted to process
2 each packet according to said data processing policy corresponding to said thread associated with
3 said packet.

1 15. The apparatus of claim 13, further comprising a memory unit connected to said first data
2 processing unit and to said second data processing unit, said memory unit adapted to temporarily
3 store packets before processing by said second data processing unit.

1 16. The apparatus of claim 1, wherein said second data processing unit comprises a plurality
2 of general purpose processors for executing instructions in parallel.

1 17. The apparatus of claim 16, wherein at least one said general purpose processor comprises
2 a complex instruction set computer processor.

1 18. The apparatus of claim 16, wherein at least one said general purpose processor comprises
2 a reduced instruction set computer processor.

1 19. A method for processing data packets, comprising:
2 receiving a first incoming packet;
3 determining whether to admit the first incoming packet;
4 assigning a first thread to the first incoming packet if said first incoming packet is
5 admitted, wherein said first thread points to a stored policy; and
6 processing the first incoming packet according to said stored policy.

1 20. The method of claim 19, wherein said stored policy comprises a first address pointer
2 pointing to the location of a first set of instructions, and wherein said processing step utilizes said
3 first set of instructions to process said first incoming packet.

1 21. The method of claim 20, wherein said stored policy further comprises a second address
2 pointer pointing to the location of a state block, and wherein said processing step utilizes said
3 state block to process the first incoming packet.

1 22. The method of claim 19, further comprising the step of storing at least one policy in a
2 policy action table.

1 23. The method of claim 22, further comprising the step of updating said policy action table.

1 24. The method of claim 19, wherein said determining step further comprises searching a
2 policy condition table for a rule corresponding to the contents of the first incoming packet.

1 25. The method of claim 19, further comprising the step of placing the first incoming packet
2 in a processing queue after said assigning step and before said processing step.

- 1 26. A method for processing data packets, comprising:
 - 2 receiving a packet; *(u)*
 - 3 comparing the packet to one or more stored rules; and
 - 4 discarding the packet unless the packet matches a rule allowing the packet to be admitted.

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